

**DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION**

TE6CH
Revision 8
Allison
AE 3007C
AE 3007A
AE 3007A1/1
AE 3007A1/2
AE 3007A1
AE 3007A1/3

May 27, 1999

TYPE CERTIFICATE DATA SHEET NO. TE6CH

Engine models described herein conforming with this data sheet (which is part of Type Certificate No. TE6CH) and other approved data on file with the Federal Aviation Administration, meet the minimum standards for use in certified aircraft in accordance with pertinent aircraft data sheets and applicable portions of the Federal Aviation Regulations provided they are installed, operated, and maintained as prescribed by the manufacturer's FAA approved manuals and other FAA approved instructions.

Type Certificate Holder: Allison Engine Company, Inc.
Indianapolis, Indiana 46206-0420

Models (See Note 11): AE 3007C, AE 3007A, AE 3007A1/1, AE 3007A1/2, AE 3007A1, AE 3007A1/3 Direct drive turbofan engine, modular design, single stage fan, 14 stage axial compressor, annular combustor, 2-stage gas generator turbine, 3-stage low pressure turbine, bottom mounted accessory gearbox, two single channel full authority digital electronic controls.

	AE 3007C (P/N 23057202)	AE 3007A (P/N 23054002)	AE 3007A1/1 (P/N 23070002)
RATINGS (see Note 1):			
Maximum Takeoff (5 min.):*			
Static thrust, lbf	6,442	7,580	7,580
Fan shaft speed, rpm	7,376	7,750	7,716
Gas generator speed, rpm	15,388	15,452	15,603
Measured interstage temperature, °f	1630	1690	1690
Normal Takeoff (5 min.):			
Static Thrust, lbf	6,442	7,580	7,580
Fan Shaft Speed, rpm	7,376	7,750	7,716
Gas Generator Speed, rpm	15,388	15,452	15,603
Measured Interstage Temperature, °F	1630	1690	1690
Maximum Continuous:			
Static Thrust, lbf	6,442	6,820	6,820
Fan Shaft Speed, rpm	7,376	7,441	7,404
Gas Generator Speed, rpm	15,388	15,204	15,366
Measured Interstage Temperature, °F	1562	1600	1605
FAN SHAFT ROTATION:(aft looking fwd)	CCW	--	--

"--" indicates "same as previous model"

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	AE 3007A1/2 (P/N 23070443)	AE 3007A1 (P/N 23070991)	AE 3007A1/3 (P/N 23070402)
RATINGS (see Note 1):			
Maximum Takeoff (5 min.):*			
Static Thrust, lbf	7,580	7,580	7,580
Fan Shaft Speed, rpm	7,823	7,903	7,903
Gas Generator Speed, rpm	15,842	16,013	16,013
Measured Interstage Temperature, °F	1738	1738	1738
Normal Takeoff (5 min.):			
Static Thrust, lbf	7,580	7,580	7201
Fan Shaft Speed, rpm	7,823	7,903	7,758
Gas Generator Speed, rpm	15,842	16,013	15,898
Measured Interstage Temperature, °F	1738	1738	1738
Maximum Continuous:			
Static Thrust, lbf	6,820	6,820	6,820
Fan Shaft Speed, rpm	7,548	7,613	7,613
Gas Generator Speed, rpm	15,619	15,778	15,778
Measured Interstage Temperature, °F	1653	1653	1653
FAN SHAFT ROTATION:	--		
(aft looking fwd)			

	AE 3007C (P/N 23057202)	AE 3007A (P/N 23054002)	AE 3007A1/1 (P/N 23070002)
PRINCIPAL DIMENSIONS OF BASIC ENGINE:			
Length (overall), in.	115.08	--	--
Width (max), in.	46.14	--	--
Height (max), in.	55.70	--	--
C. G. location, dry*			
• Station, inches	93.25	--	--
• Butt Line, inches	100.1	--	--
• Water Line, inches	98.4	--	--
WEIGHT (dry), lb.:	1,588	1,609	1,614
	AE 3007A1/2 (P/N 23070443)	AE 3007A1 (P/N 23070991)	AE 3007 A1/3 (P/N 23070402)
PRINCIPAL DIMENSIONS OF BASIC ENGINE:			
Length (overall), in.	--	--	--
Width (max), in.	--	--	--
Height (max), in.	--	--	--
C. G. location, dry*			
• Station, inches	--	--	--
• Butt Line, inches	--	--	--
• Water Line, inches	--	--	--
WEIGHT (dry), lb.:	1,614	1,614	1,614

*C.G. Reference: Station = Engine Axial Station (Inlet flange = 47.908 in.); Butt Line 100.00 = Engine Horizontal Centerline; Water Line 100.00 = Engine Vertical Centerline

ENGINE CONTROL SYSTEM: Lucas Aerospace Full Authority Digital Electronic Control
(major components) (FADEC), qty 2.

Lucas Aerospace Fuel Pump & Metering Unit (FPMU)

Lucas Aerospace Compressor Variable Geometry (CVG) actuator.

	AE 3007C (P/N 23057202)	AE 3007A (P/N 23054002)	AE 3007A1/1 (P/N 23070002)
Fuels:	Kerosene, commercial turbine fuel conforming to: MIL-T-5624, Grade JP-4 and JP-5 or MIL-T-83133, Grade JP-8 or ASTM D1655, Jet A/A-1 and Jet B, GOST 10227-86 TS-1 and RT.	--	--
Lubrication Oil:	Synthetic oil conforming to MIL-L-23699D or MIL-L-7808K (below -40°F).	--	--
Ignition System:	BF Goodrich Aerospace, Engine Electrical Systems Division dual capacitance discharge, high energy type exciters, dual igniter plugs.	--	--
Certification Basis:	14 CFR Part 33 dated February 1, 1965, with Amendments 1 through 14 inclusive and 14 CFR Part 34. Original application for Type Certificate dated May 24, 1990, amended December 22, 1992. Type Certificate No. TE6CH, issued February 28, 1995.	14 CFR Part 33 dated February 1, 1965, with Amendments 1 through 15 inclusive and 14 CFR Part 34. Original application for Type Certificate dated May 10, 1994. Type Certification No. TE6CH amended November 27, 1996.	14 CFR Part 33 dated February 1, 1965, with Amendments 1 through 15 inclusive and 14 CFR Part 34. Original application for Type Certificate dated March 5, 1998. Type Certification No. TE6CH amended April 15, 1998.
Production Basis:	Production Certificate No. 310	--	--

	<u>AE 3007A1/2</u> <u>(P/N 23070443)</u>	<u>AE 3007A1</u> <u>(P/N 23070991)</u>	<u>AE 3007A1/3</u> <u>(P/N 23070402)</u>
Fuels:	--	--	--
Lubrication Oil:	--	--	--
Ignition System:	--	--	--
Certification Basis:	14 CFR Part 33 dated February 1, 1965, with Amendments 1 through 15 inclusive and 14 CFR Part 34. Original application for Type Certificate dated March 17, 1998. Type Certification No. TE6CH amended June 15, 1998.	14 CFR Part 33 dated February 1, 1965, with Amendments 1 through 15 inclusive and 14 CFR Part 34. Original application for Type Certificate dated June 17, 1998. Type Certification No. TE6CH amended November 6, 1998.	14 CFR Part 33 dated February 1, 1965, with Amendments 1 through 15 inclusive and 14 CFR Part 34. Original application for Type Certificate dated Dec 15, 1998. Type Certification No. TE6CH amended May 27, 1999.
Production Basis:	--	--	--

NOTE 1.

Engine ratings are based on:

<u>AE 3007C, AE 3007A, AE 3007A1/1</u> <u>(P/N23057202, P/N23054002,</u> <u>P/N23070002)</u>	<u>AE 3007A1/2</u> <u>(P/N 23070443)</u>	<u>AE 3007A1, AE 3007A1/3</u> <u>(P/N 23070991, P/N 23070402)</u>
Sea level static, 29.92" Hg	--	--
Flat rated to 86°F (ISA+27°F, ISA+ 15 °C) inlet temperature	Flat rated to 100.4°F (ISA+41.4°F, ISA+23°C) inlet temperature	Flat rated to 113°F (ISA+54°F, ISA+30°C) inlet temperature
100% inlet pressure recovery	--	--
Exhaust nozzle area (A9) of 670.1 in. ²	--	--
Zero relative humidity	--	--
No inlet air distortion	--	--
No customer bleed extraction	--	--
No external power extraction	--	--
No anti-ice airflow	--	--

NOTE 2:

	AE 3007C (P/N 23057202)	AE 3007A (P/N 23054002)	AE 3007A1/1 (P/N 23070002)
Temperature Limits:			
Measured Interstage Turbine Temperature (same as T4.5 and ITT)			
Takeoff (5 minutes)	1630°F	1690°F	1690°F
Maximum Continuous	1562°F	1600°F	1605°F
Starting	1472°F	1472°F	1472°F
Oil Inlet Temperature:			
Maximum	260°F	--	--
Minimum	-40°F (MIL-L-23699) -65°F (MIL-L-7808)	--	--
Fuel Pump Inlet Temperature:			
Minimum	-65°F, or that temperature corresponding to a fuel viscosity of 22 centistokes, whichever is higher **	--	--
Maximum steady state	135°F	--	--

	AE 3007A1/2 (P/N 23070443)	AE 3007A1 (P/N 23070991)	AE 3007A1/3 (P/N 23070402)
Temperature Limits:			
Measured Interstage Turbine Temperature (same as T4.5 and ITT)			
Takeoff (5 minutes)	1738°F	1738°F	1738°F
Maximum Continuous	1653°F	1653°F	1653°F
Starting	1472°F	1472°F	1472°F
Oil Inlet Temperature:			
Maximum	--	--	--
Minimum	--	--	--
Fuel Pump Inlet Temperature:			
Minimum	--	--	--
Maximum steady state	--	--	--

** Refer to AE 3007C Installation Design Manual (CSP 34011) or AE 3007A Installation Design Manual (CSP 34021), AE 3007A1/1 Installation Design Manual (CSP 34073), AE 3007A1/2 Installation Design Manual (CSP 34074), AE 3007A1 Installation Design Manual (CSP 34070), and AE 3007A1/3 Installation Design Manual (CSP 34075) for environmental operating restrictions.

External Engine Component Maximum Temperatures:

The maximum component operating temperatures are listed in the AE 3007C Installation Design Manual (CSP 34011) or the AE 3007A Installation Design Manual (CSP 34021), AE 3007A1/1 Installation Design Manual (CSP 34073), AE 3007A1/2 Installation Design Manual (CSP 34074), AE 3007A1 Installation Design Manual (CSP 34070), and AE 3007A1/3 Installation Design Manual (CSP 34075).

NOTE 3.

	AE 3007C (P/N 23057202)	AE 3007A, AE 3007A1/1, AE 3007A1/2, AE 3007A1, AE 3007A1/3 (P/N 23054002, 23070002, 23070443, 23070991, 23070402)
Maximum Permissible Speeds:		
Low Pressure Turbine	8700	8700
High Pressure Turbine	16123	16270

NOTE 4.

	AE 3007C (P/N 23057202)	AE 3007A, AE 3007A1/1, AE 3007A1/2, AE 3007A1, AE 3007A1/3 (P/N 23054002, 23070002, 23070443, 23070991, 23070402)
Pressure Limits:		
Oil Pressure Limits:		
Maximum, psig	95 (For oil temperature > 70°F)	--
Minimum, psig	48 (N2 ≥ 14000 rpm, 88%) 34 (N2 < 14000 rpm, 88%)	--
Fuel Pump Inlet Pressure:		
Minimum	For Jet A, A-1/JP-5, refer to AE 3007C Installation Design Manual, Section 1 (CSP 34011).	For Jet A, A-1/JP-5, refer to AE 3007A or AE 3007A1/1 or AE 3007A1/2 or AE 3007A1 or AE 3007A1/3 Installation Design Manual, Section 1 (CSP 34021 or CSP 34073 or CSP 34074 or CSP 34070, or CSP 34075).
	For Jet B/JP-4, refer to AE 3007C Installation Design Manual, Section 1 (CSP 34011).	For Jet B/JP-4, refer to AE 3007A or AE 3007A1/1 or AE 3007A1/2 or AE 3007A1 or AE 3007A1/3 Installation Design Manual, Section 1 (CSP 34021 or CSP 34073 or CSP 34074 or CSP 34070 or CSP 34075).
Maximum, psig	55	--

NOTE 5.

Accessory Drive Provisions:

Accessory	Direction of Rotation	Speed Ratio	Normal Load***	Cyclic Overload Load***	Failure Overload Load***	Max Shear Torque	Max Overhung Moment
Generator 1	CW, FLA	0.745	(HP) 23.5	(HP) 43.5	(HP) --	(in.lb) 1600.	(in. lb.) 300
Generator 2	CW, FLA	0.745	23.5	43.5	--	1600.	300
Hydraulic pump	CW, FLA	0.473	13.0	37.3	42	1840.	160

*** The maximum total accessory horsepower extraction for all thrust settings and flight conditions is 60 HP.

An overload limit of 80 HP is permitted for a period of 5 minutes at all thrust settings and all flight conditions below 45,000 feet. Cyclic overload defined as 5 min/1 hour of operation. Failure overload defined as 1 min/10,000 hours of operation.

NOTE 6.

For the AE 3007C, the maximum permissible bleed flow rate is 7.0% of core air flow for the 8th stage and 12% of core air flow for the 14th stage when each stage is opened independently. The maximum permissible total bleed air extraction is 17.5% of core air flow when both stages are opened simultaneously.

For the AE 3007A, the maximum permissible bleed flow rate is 8.5% of core air flow for the 9th stage and 10.5% of core air flow for the 14th stage when each stage is opened independently. The maximum permissible total bleed air extraction is 18.0% of core air flow when both stages are opened simultaneously. The maximum permissible fan-bypass bleed air flow is 90 lbm/min.

For the AE 3007A1/1, AE 3007A1/2, AE 3007A1, and AE 3007A1/3 the maximum permissible 9th stage bleed flow is 7.9% of core air flow for the 9th stage and 9.3% of core air flow for the 14th stage when each stage is opened independently. The maximum permissible total bleed air extraction is 16.5% of core air flow when both stages are opened simultaneously. The maximum permissible fan-bypass bleed air flow is 90 lbm/min.

NOTE 7.

Mandatory replacement times (life limits) established for critical components and mandatory airworthiness inspections for the AE 3007C, AE 3007A, AE 3007A1/1, AE 3007A1/2, AE 3007A1, and AE 3007A1/3 are published in the Chapter 5 of the noted Maintenance Manuals:

AE 3007C	AE 3007A, AE 3007A1/1, AE 3007A1/2, AE 3007A1, AE 3007A1/3
<u>(P/N 23057202)</u>	<u>(P/N 23054002, 23070002, 23070443,</u> <u>23070991, 23070402)</u>
CSP 34012	CSP 34022

NOTE 8.

The accessory gearbox mounted accessories provided as part of the engine include:

Permanent Magnetic Alternator (PMA)
Fuel Pump & Metering Unit (FPMU)
Oil Pump

Engine accessory gearbox mounting pads are provided for aircraft generators (2), starter, and the aircraft system hydraulic pump.

NOTE 9.

Aircraft mounted engine control equipment consists of Qty. 2 FADEC assembly units as defined in the following Electrical System Assembly Drawings:

AE 3007C	AE 3007A, AE 3007A1/1, AE 3007A1/2, AE 3007A1, AE 3007A1/3
23057016, Revision D or later	23054366, Revision Y or later

For P/N 23066394 FADECs, the following restrictions apply:

- Do not attempt a takeoff with corrected fan speed below 73.56% (6400 rpm).
- Data from aircraft Air Data Computer (ADC) must be continuously available to the engine for compliance with 14 CFR 33.77(b).

ADC data must be provided from sources that are physically, electrically, and pneumatically isolated.

NOTE 10.

Criteria pertaining to the dispatch and maintenance requirements for the AE 3007A, AE 3007A1/1, AE 3007A1/2, AE 3007A1, and AE 3007A1/3 engine control system are specified in Chapter 5 of the AE 3007A Series Maintenance Manual, CSP 34022, which defines the various configurations and maximum operating intervals.

NOTE 11.**Model Description**

The AE 3007C, AE 3007A, AE 3007A1/1, AE 3007A1/2, AE 3007A1, and AE 3007A1/3 engines are direct drive engines of modular design and incorporate a single stage fan which is connected to the three-stage low pressure turbine. The engines incorporate a 14-stage axial compressor with six stages of variable vanes (including inlet guide vanes), an annular combustor, and a two-stage high pressure turbine. The engines have a full length composite outer duct. The engines include fore and aft mounting provisions which permit underwing pylon or aft fuselage mounting installation.

The following are differences between the five models:

	AE 3007C (P/N 23057202)	AE 3007A, AE 3007A1/1, AE 3007A1/2, AE 3007A1, AE 3007A1/3 (P/N 23054002, 23070002, 23070443 23070991, 23070402)
Fan Blades	P/N 23060567 (Type III)	P/N 23061623 (Type IV)
High Pressure Compressor Bleed	8th stage	9th stage
Fan Bypass Bleed	None	Yes
Rear Mount Support Ring	Rotable Position	Fixed Position
Fuel Flow Meter - Allison Supplied	No	Yes

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